

MJPEG/MPEG-4 Video Receiver **RX7101**
NETWORK VIDEO RECEIVER
User's Manual



Product name:	Video Receiver (RX7101)
Release Date:	2009/3/26
Manual Revision:	2.1
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Before You Use This Product

The use of surveillance devices may be prohibited by law in your country. It is the user's responsibility to ensure that the operation of such devices is legal before installing this unit for its intended use.

It is important to first verify that all contents received are complete according to the list in the "Package Contents" chapter. Take notice of the warnings in "Quick installation guide" before the Video Receiver is installed, then carefully read and follow the instructions in the "Installation" chapter to avoid damages due to faulty assembly and installation. This also ensures the product is used properly as intended.

The Video Receiver is a network device and its use should be straightforward for those who have basic network knowledge. The "Troubleshooting" chapter in the Appendix provides remedies to the most common errors in set up and configuration. You should consult this chapter first if you run into a system error.

The Video Receiver is designed for various applications including video surveillance, camera control, etc. The "How to Use" chapter suggests ways to best utilize the Video Receiver and ensure proper operations. For the creative and professional developers, the "URL Commands of The Video Receiver" chapter serves to be a helpful reference to customize existing homepages or integrating with the current web server.

For paragraphs preceded by  the reader should use caution to understand completely the warnings. Ignoring the warnings may result in serious hazards or injuries.

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Package Contents

RX7101



Software CD



Power adapter



Quick installation guide



Terminal connector



Warranty card

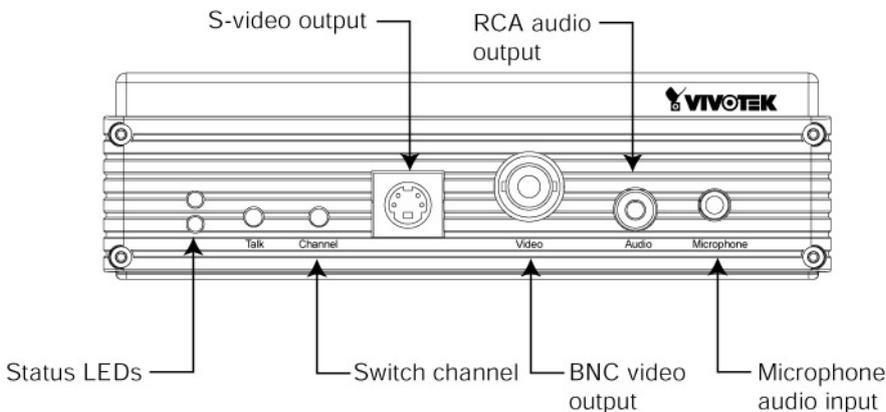


Installation

The Video Receiver only supports one privileged account to access and configure it. In this manual, "Administrator" refers to the person.

Physical Description

Front Panel



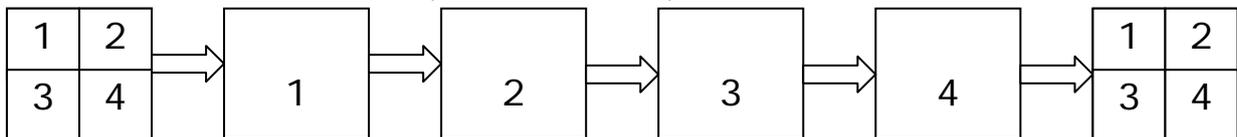
“Status LEDs” Two LEDs show the status of Video Receiver. Please refer to the Appendix Troubleshooting for details.

“Talk” The button is reserved to support two way audio.

“Switch channel”

(1) In the multiple channel mode and “Sequential display” were set, to push the button to stop or start the display of sequential channel.

(2) In the multiple channel mode and “Quad display” were set, to push the button to switch the channel for one run, the behavior is, -> Quad -> 1 -> 2 -> 3 -> 4 -> Quad.



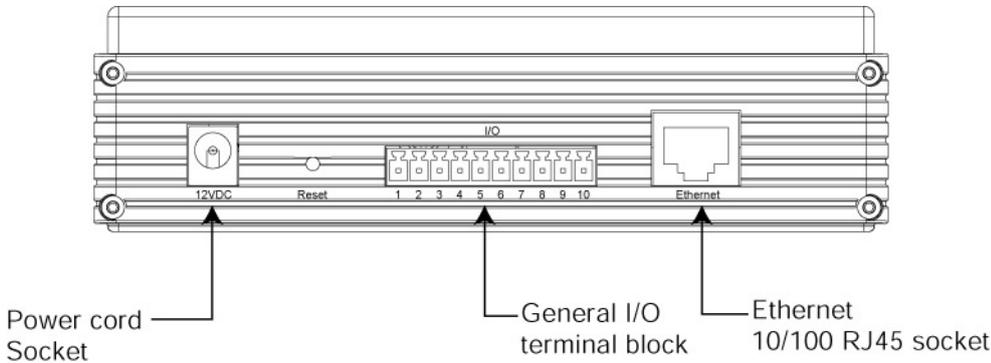
“S-video output” Video output for S-video connector

“BNC video output” Video output for BNC connector

“RCA audio output” Audio output for RCA connector

“Microphone audio input” Microphone input is reserved to support two way audio.

Rear Panel



“Power cord socket” Plug the power jack of the included power adapter to Video Receiver. Connecting the power adapter should be the last operation while physically installing Video Receiver.

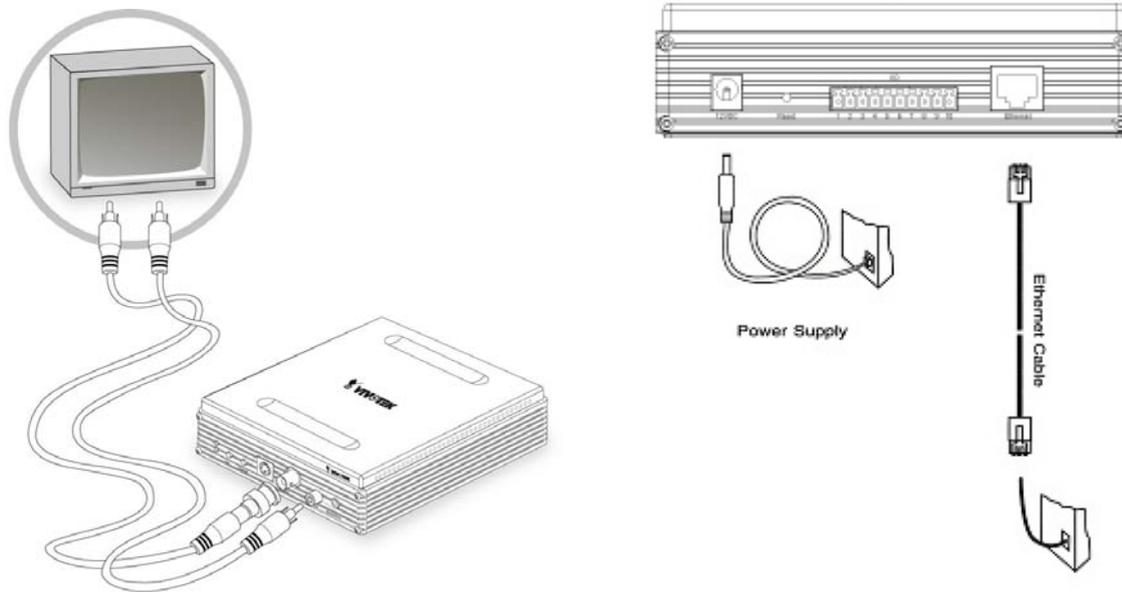
“Reset button” Refer to the Appendix [Troubleshooting](#) for the detailed usage of system recovery.

“General I/O terminal block” Video Receiver provides a very flexible general I/O interface to combine with the user’s security devices such as alarms, lighting or door locks. One green connector is included in the package to connect the external devices. The general I/O terminal block has 10 pins for device control. These pins can be divided into three categories based on their functions, including power source, RS485 and digital outputs.

No.	Pin description	Regulation
1	AC power input	24V AC
2	AC power input	24V AC
3	Digital output 1	Darlington, Max. 500mA
4	Digital output 2	Darlington, Max. 500mA
5	Digital output 3	Darlington, Max. 500mA
6	Digital output 4	Darlington, Max. 500mA
7	DC power output (+)	12V DC, Max. 0.5A
8	DC power output (-)	Ground
9	RS485_A	D+, non-inverting
10	RS485_B	D-, inverting

“Ethernet 10/100 RJ45 socket” Connect to an Ethernet network with a UTP category 5 cable of length shorter than 100 meters according to the standard.

Hardware Installation



Please verify that your product package contains all the accessories listed in the foregoing Package Contents. Depending on the user's application, an Ethernet cable may be needed. The Ethernet cable should meet the specs of UTP Category 5 and not exceed 100 meters in length.

 Connect the power adapter jack to the Video Receiver before plugging in to the power socket. This will reduce the risk of accidental electric shock.

Shut down all the peripheral devices prior to connection. The video BNC/S-Video, Ethernet cable and power adapter are essential for basic viewing function. Refer to the related configuration section for detailed description.

Upon powering up, the front red LED will become lighted first and then the device will go through booting process. During the booting process, red and green LEDs will be on. After booted, the Video Receiver will standby for getting IP address. After getting IP Address, the green LED will blink every second.

The Video Receiver will first detect Ethernet. If it does not connect to Ethernet, the system booting will fail. Please connect the Ethernet cable and power on again. When system boot up, the green LED will flash every second as heartbeat to indicate alive. If the green LED is off, please check the network connections. When system is alive, go to next paragraph "Software installation".

Software installation

At the end of the hardware installation, users can use Installation Wizard program included in the product CDROM to find the location of the Video Receiver. There may be many Video Receivers in the local network. Users can differentiate the Video Receiver with the MAC. The MAC is printed on the label on the back of the Video Receiver body. For more detail, please refer to the user's manual of Installation Wizard 2.

Once installation is complete, the Administrator should proceed to the next section "Initial access to the Video Receiver" for necessary checks and configurations.

Initial Access to the Video Receiver

Check Network Settings

The Video Receiver can be connected either before or immediately after software installation onto the Local Area Network. The Administrator should complete the network settings on the configuration page, including the correct subnet mask and IP address of gateway and DNS. Ask your network administrator or Internet service provider for the detail information. By default the Video Receiver requires the Administrator to run installation every time it reboots. Please refer to "Network settings" on the System Configuration page for details. If any setting is entered incorrectly and cannot proceed to setting up the Video Receiver, restore the factory settings following the steps in the "Troubleshooting" chapter of the Appendix.

Add Password to Prevent Unauthorized Access

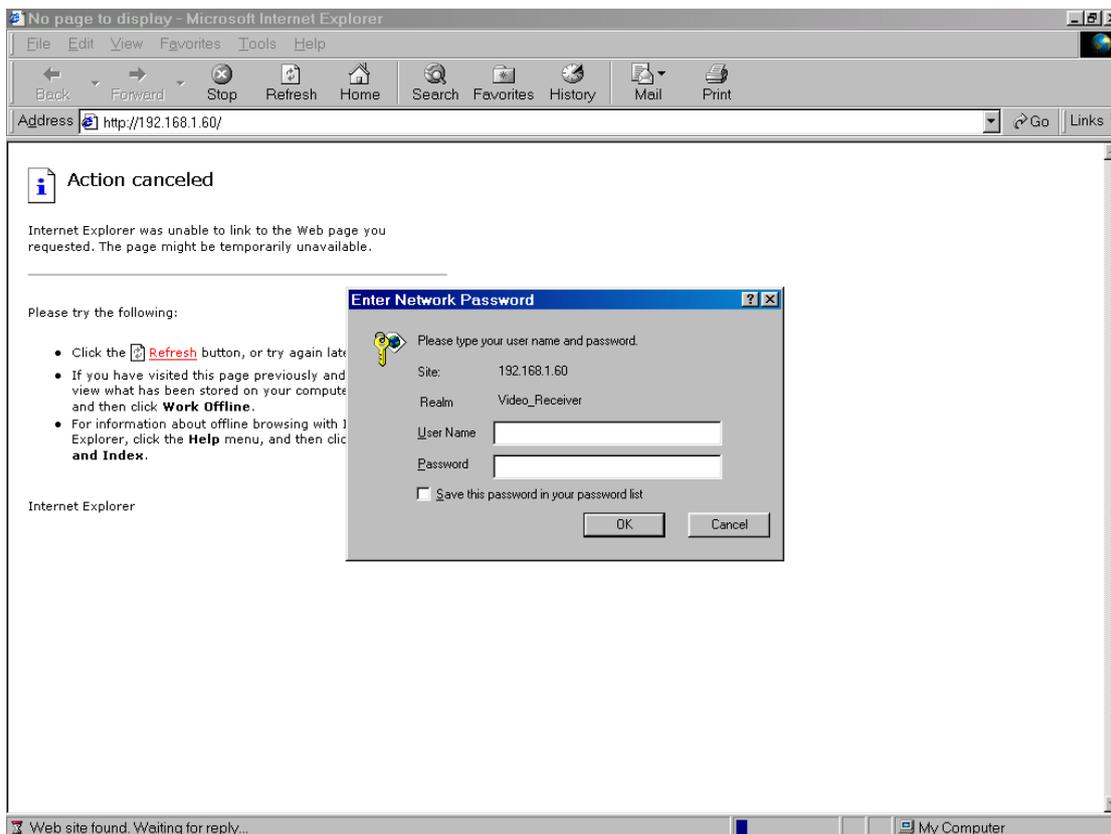
The default Administrator's password is blank and the Video Receiver initially will not ask for any password. The Administrator should immediately implement a new password as a matter of prudent security practice. Once the Administrator's password is saved, the Video Receiver will ask for the user's name and password before each access. The user name for the Administrator is permanently assigned as "root". Once the password is changed, the browser will display an authentication window to ask for the new password. **Once the password is set, there is no provision to recover the Administrator's password. The only option is to restore to the original factory default settings.**

How to Use

Authentication

After opening the Web browser and typing in the URL of the Video Receiver, a dialogue window pops up to request a username and password. Upon successful authentication, the following figure is displayed.

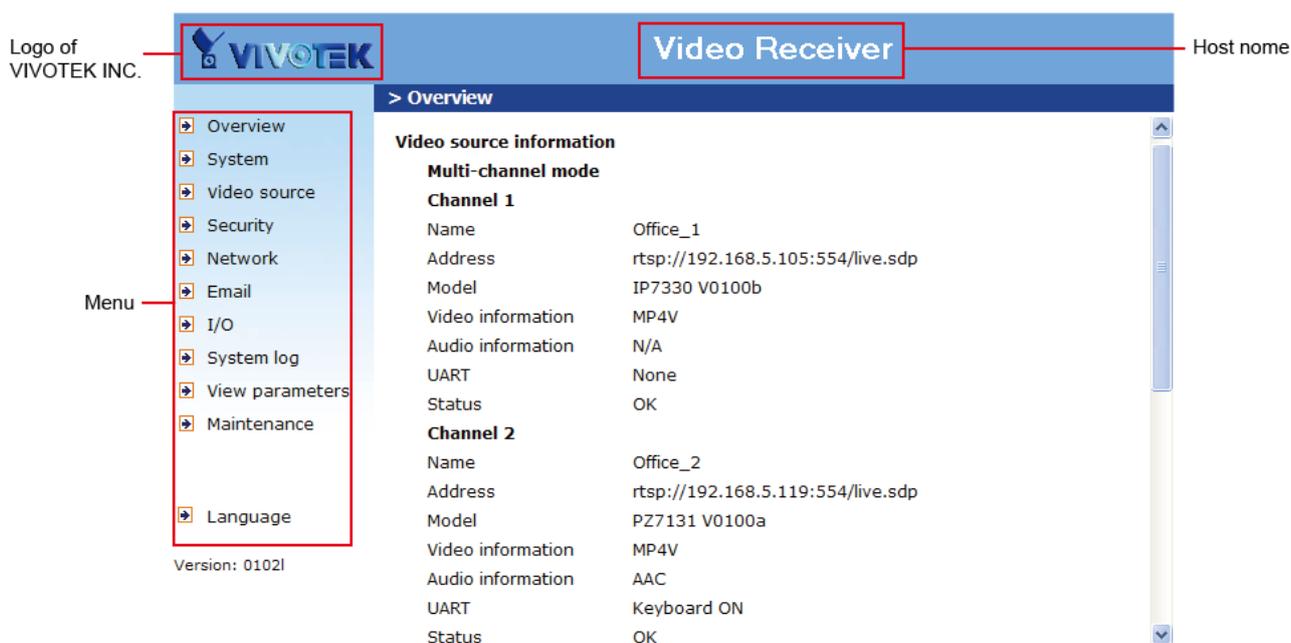
The foreground is the login window and the background shows the message if authentication fails. The option box can be checked to save the password for future convenience. But it is not available to the Administrator for obvious reason.



*If the administrator (root user) assigns no password, everybody can access the homepage directly.

Main Page

This chapter explains the layout of the main page. It is composed of the following four sections: Logo of VIVOTEK INC., Menu, Host name, and information of Overview.



Logo of VIVOTEK INC.

Video Receiver

Host name

> Overview

Menu

- Overview
- System
- Video source
- Security
- Network
- Email
- I/O
- System log
- View parameters
- Maintenance
- Language

Version: 0102I

Video source information

Multi-channel mode

Channel 1

Name	Office_1
Address	rtsp://192.168.5.105:554/live.sdp
Model	IP7330 V0100b
Video information	MP4V
Audio information	N/A
UART	None
Status	OK

Channel 2

Name	Office_2
Address	rtsp://192.168.5.119:554/live.sdp
Model	PZ7131 V0100a
Video information	MP4V
Audio information	AAC
UART	Keyboard ON
Status	OK

Video Receiver supports maximum twenty video sources. The display mode can be single channel and multiple channels. And the multiple channel display can display four channels simultaneously or twenty-channel sequentially. In sequential mode the period of showing a channel can be adjusted. Please refer to "Video source settings" for detailed information.

Primary capability of Video Receiver

Video

The Video Receiver supports maximum twenty video sources. The display mode can be single channel and multiple channels. And the multiple channel display can be display four channels simultaneously or twenty-channel sequentially. In sequential mode the period of showing a channel can be adjusted.

- When single channel mode is selected, only channel 1 is effective.
- In single channel mode, the video resolution can be set up to D1, the receiver automatically scale all other resolutions to full D1 at display.
- In multiple channel mode, the maximum video resolution is CIF, the receiver automatically scale all other resolutions to CIF at quad display mode and scale to D1 in sequential display mode

Audio

The Video Receiver only supports single audio channel output and the volume can be tuned.

I/O

Digital output

The Video Receiver has four digital outputs, they can be configured to following any digital output of video source.

Keyboard

The Video Receiver supports keyboard to send PTZ commands to control PTZ camera.

- The Video Receiver only supports PELCO-D protocol now.
- The Video Receiver can send CGI command to control the PT functions of PT 7000 series.

OSD (On Screen Display)

The Video Receiver provides the following information for showing the connection or display status.

- If the IP address is empty, the video output shows "No Video" on the top-right corner.
- If the IP address is configured but the channel is disconnected, the video output shows the IP address on the top-right corner.
- In sequential multi-channel mode, if the periodic channel switch is stopped, there should be a channel ID on the top-right corner.

Definitions in Configuration

The Administrator can access system configuration. Each category in the left column will be explained in the following pages. The bold texts are the specific phrases on the Option pages. The Administrator may type the URL below the figure to directly enter the frame page of configuration. If the Administrator also wants to set certain options through the URL, read the reference appendix for details.

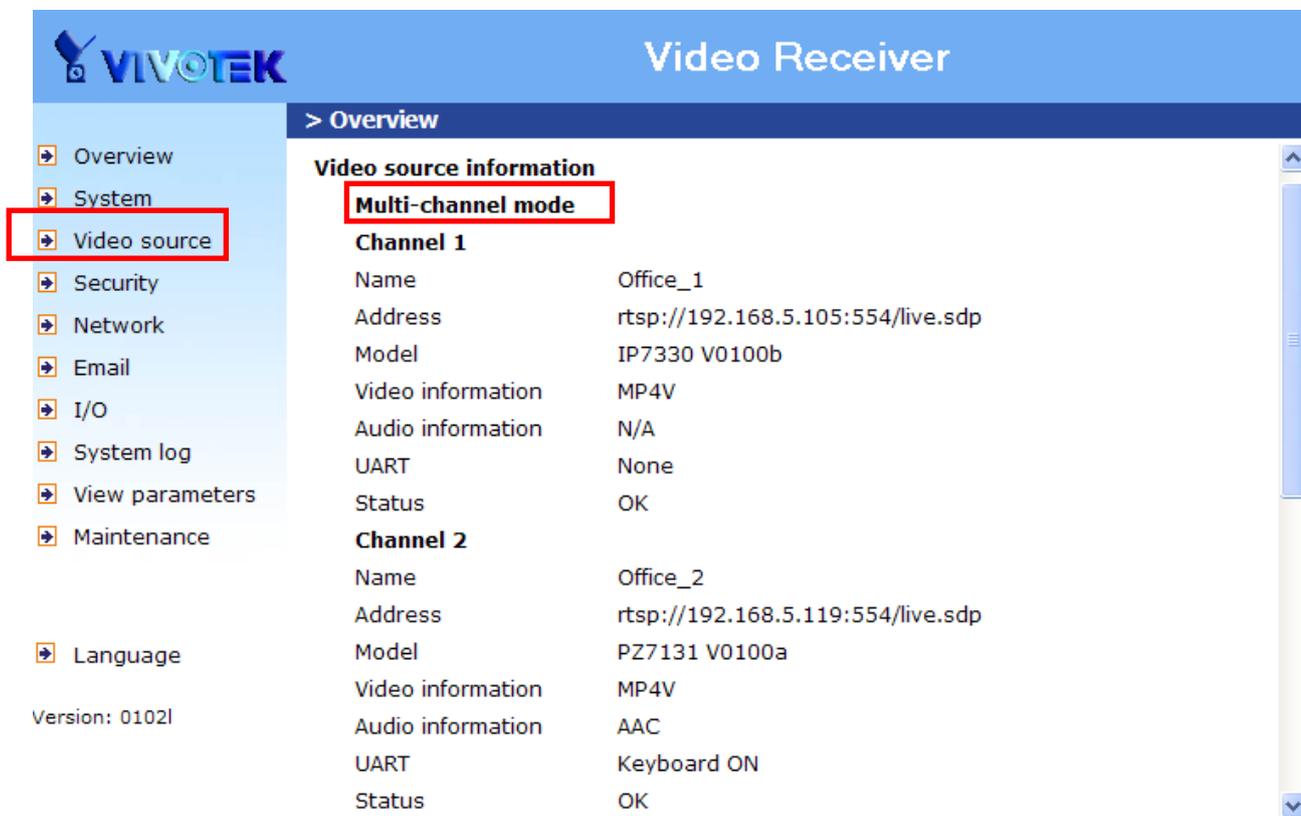
Overview

If the Video sources have been set, the overview page will show the basic information about the servers. In the default situation, it will show the information of “Single channel mode”.



The screenshot displays the VIVOTEK Video Receiver configuration interface. The top header is blue with the VIVOTEK logo on the left and 'Video Receiver' on the right. Below the header is a dark blue navigation bar with '> Overview'. A light blue sidebar on the left contains a menu with the following items: Overview, System, Video source, Security, Network, Email, I/O, System log, View parameters, Maintenance, and Language. The main content area is white and shows 'Video source information' in bold. Below this, 'Single channel mode' is displayed in a red-bordered box, with 'N/A' underneath it.

If the “Multiple channel mode” is selected, it will show the information of four channels. Please refer to “Video source” setting for detailed information.



The screenshot displays the VIVOTEK Video Receiver web interface. The left sidebar contains a navigation menu with the following items: Overview, System, Video source (highlighted with a red box), Security, Network, Email, I/O, System log, View parameters, Maintenance, and Language. The main content area is titled 'Video Receiver' and shows the 'Overview' section. Under 'Video source information', the 'Multi-channel mode' is selected and highlighted with a red box. Below this, two channels are listed:

Channel 1	
Name	Office_1
Address	rtsp://192.168.5.105:554/live.sdp
Model	IP7330 V0100b
Video information	MP4V
Audio information	N/A
UART	None
Status	OK

Channel 2	
Name	Office_2
Address	rtsp://192.168.5.119:554/live.sdp
Model	PZ7131 V0100a
Video information	MP4V
Audio information	AAC
UART	Keyboard ON
Status	OK

System settings

"Host name" The text displays the title at the top of the banner.

"Keep current date and time" Click on this to reserve the current date and time of the Video Receiver. An internal real-time clock maintains the date and time even when the power of the system is turned off.

"Sync with computer time" Synchronizes the date and time of the Video Receiver with the local computer. The read-only date and time of the PC is displayed as updated.

"Manual" Adjust the date and time according to what is entered by the Administrator. Notice the format in the related fields while doing the entry.

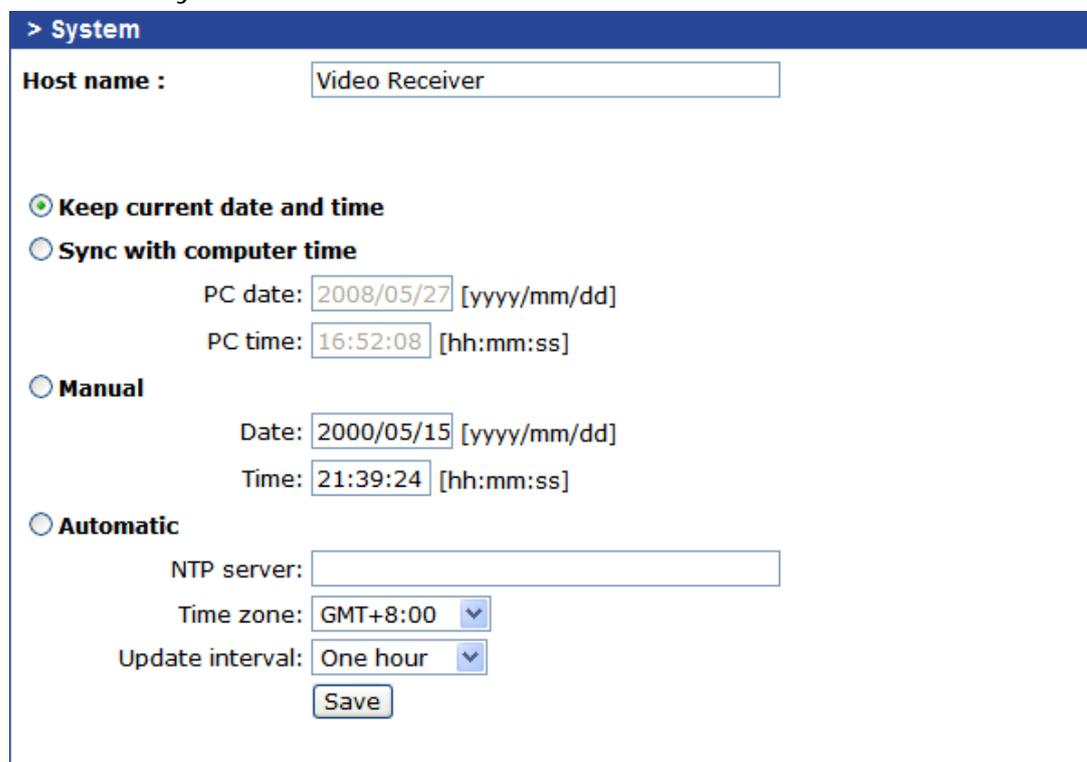
"Automatic" Synchronize with the NTP server over the Internet whenever the Video Receiver starts up. It will fail if the assigned time-server cannot be reached.

"NTP server" Assign the IP address or domain name of the time-server.

"Time zone" Adjust the time with that of the time-servers for local settings.

"Update interval" Select hourly, daily, weekly, or monthly update with the time on the NTP server.

Remember to click "Save" to immediately validate the changes. Otherwise, the correct time will not be synchronized.



The screenshot shows a web interface for system settings. At the top, there is a blue header with a right-pointing arrow and the text "> System". Below the header, the "Host name" field is set to "Video Receiver". There are four radio button options: "Keep current date and time" (selected), "Sync with computer time", "Manual", and "Automatic". Under "Sync with computer time", there are fields for "PC date" (2008/05/27) and "PC time" (16:52:08). Under "Manual", there are fields for "Date" (2000/05/15) and "Time" (21:39:24). Under "Automatic", there are fields for "NTP server" (empty), "Time zone" (GMT+8:00), and "Update interval" (One hour). A "Save" button is located at the bottom of the form.

Video source settings

There are three parts of video source settings: **“Mode”**, **“Video source list”**, and **“Display list”**.

Mode

- Single channel mode
- Multiple channel mode
 - Sequential display
 - Channel switch period: seconds
- Quad display

Video source list

Name	Model	Address
------	-------	---------

Auto detection

Create

Modify

Delete

Information

Add to display list

Display list for single display mode

Name	Model	Status
------	-------	--------

Remove

Up

Down

Save

"Mode"

Select **"Single channel mode"**, or **"multiple channel mode"** which you want to display on the TV or monitor. The multiple channel mode can display four channels simultaneously (**Quad display**) or twenty-channel sequentially (**Sequential display**).

Mode

Single channel mode

Multiple channel mode

Sequential display

Channel switch period: seconds

Quad display

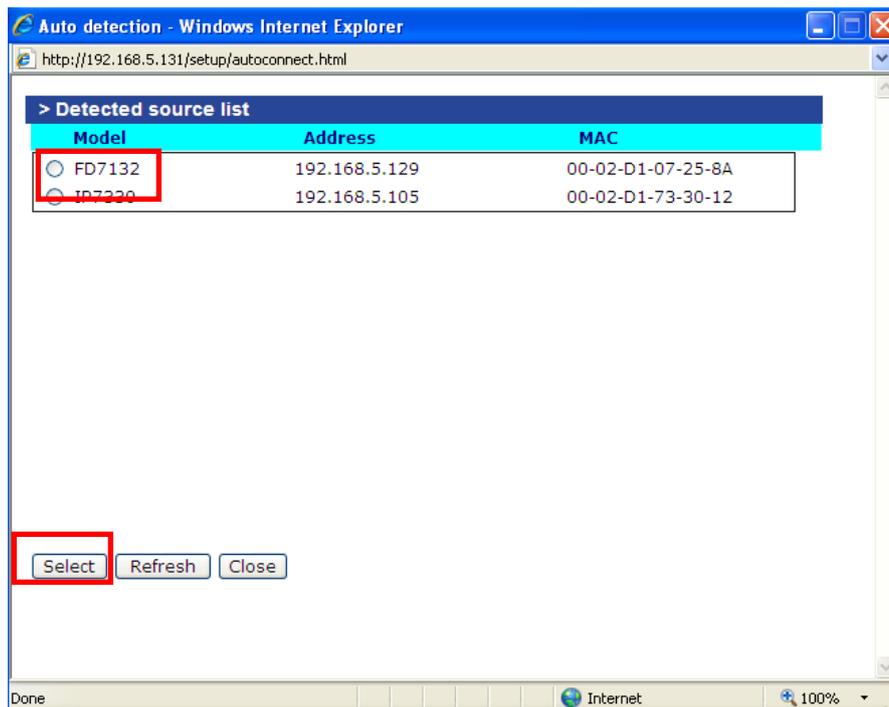
"Video source list"

To manage the video source list.

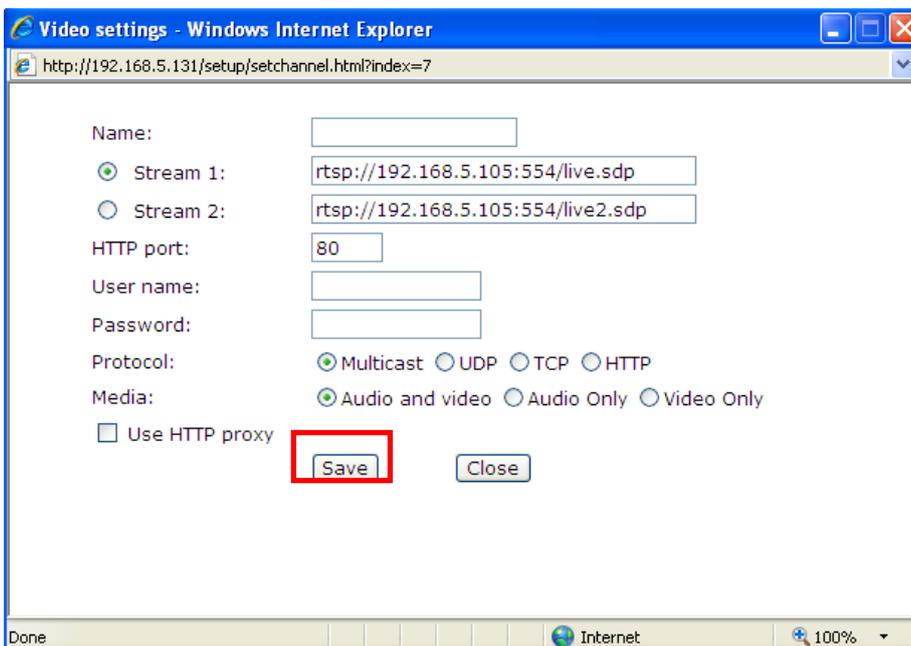
Video source list

Name	Model	Address
------	-------	---------

"Auto detection" click this button to search for all detected sources in the same LAN.

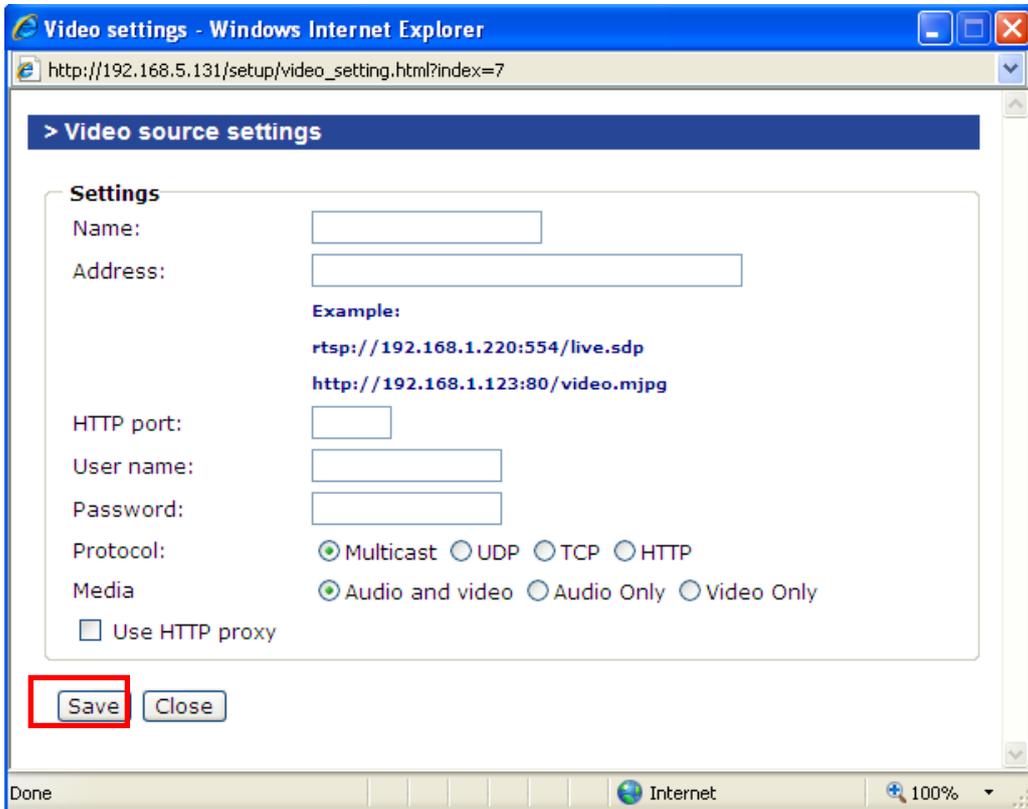


Select one of sources and click "Select" to configure it.



Enter a descriptive Name for the video source, choose either Stream 1 or Stream 2 as the source, and enter the User name and Password if necessary. There are four types for RTSP streaming: Multicast, UDP, TCP and HTTP. Video and audio can be chosen independently. If you want to Use HTTP proxy, configure it first in the Network Settings page. Remember to click "Save" to enable the source settings.

“Create” click this button if you would like to manually set up the source information. Remember to click “Save” to enable the source settings.



Video settings - Windows Internet Explorer
http://192.168.5.131/setup/video_setting.html?index=7

> Video source settings

Settings

Name:

Address:

Example:
rtsp://192.168.1.220:554/live.sdp
http://192.168.1.123:80/video.mjpg

HTTP port:

User name:

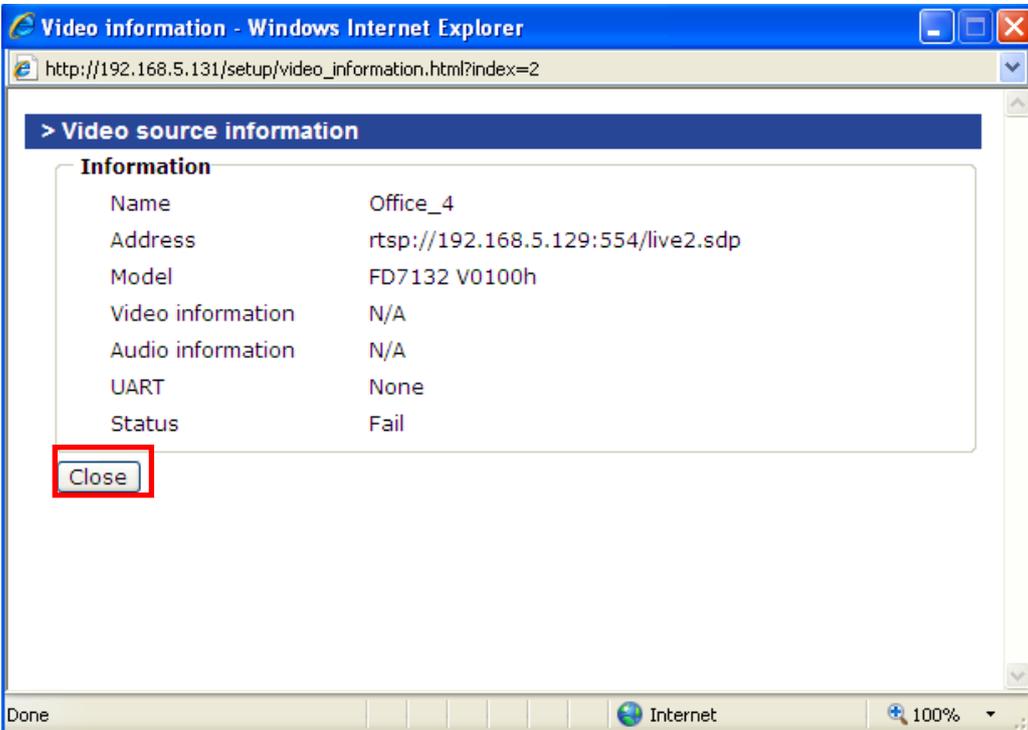
Password:

Protocol: Multicast UDP TCP HTTP

Media Audio and video Audio Only Video Only

Use HTTP proxy

Done Internet 100%



Video information - Windows Internet Explorer
http://192.168.5.131/setup/video_information.html?index=2

> Video source information

Information

Name	Office_4
Address	rtsp://192.168.5.129:554/live2.sdp
Model	FD7132 V0100h
Video information	N/A
Audio information	N/A
UART	None
Status	Fail

Done Internet 100%

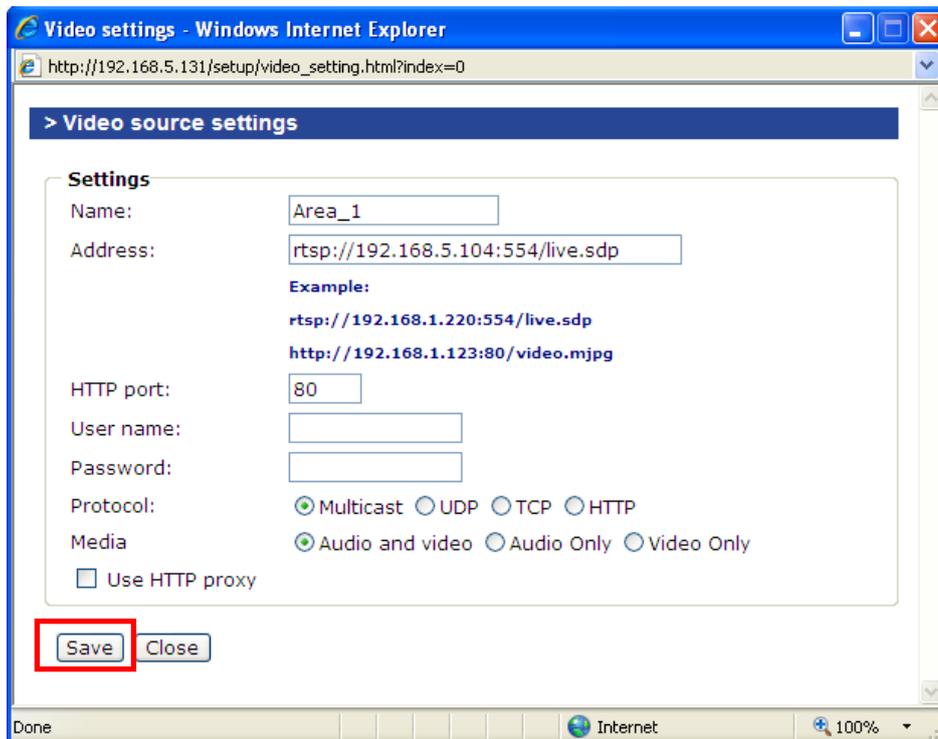
Click "Close" to quit the Video information page. The video sources will be displayed in the column of video source list.

For example:

Video source list

Name	Model	Address
Area_1	SD7151	rtsp://192.168.5.104:554/live.sdp
Office_1	IP7330	rtsp://192.168.5.105:554/live.sdp
Office_4	FD7132	rtsp://192.168.5.129:554/live2.sdp
Office_3	FD7132	rtsp://192.168.5.129:554/live.sdp
Office_2	IP7330	rtsp://192.168.5.105:554/live2.sdp
Lobby_1	VS7100	rtsp://192.168.5.136:554/live.sdp
Lobby_2	I27151	rtsp://192.168.5.138:554/live.sdp

"Modify" Select a video source from the list and then click this button to open the Video source settings page. Remember to click "Save" after adding modification.



Video settings - Windows Internet Explorer

http://192.168.5.131/setup/video_setting.html?index=0

> Video source settings

Settings

Name:

Address:

Example:

rtsp://192.168.1.220:554/live.sdp

http://192.168.1.123:80/video.mjpg

HTTP port:

User name:

Password:

Protocol: Multicast UDP TCP HTTP

Media Audio and video Audio Only Video Only

Use HTTP proxy

"Delete" Select a video source from the list and then click this button to delete it.

"Information" Select a video source from the list and then click this button to open the Video information window.

“Add to display list” Click this button to add video sources to the Display list according to the Display Mode selected in the first column.

"Single channel mode" You can only add one video source to the Display list, and the Video Receiver will show only one channel in video output. The video resolution can be set up to D1. Remember to click “Save” to enable the source settings.

For example:

Mode

Single channel mode
 Multiple channel mode
 Sequential display
 Channel switch period: seconds
 Quad display

Video source list

Name	Model	Address
Area_1	SD7151	rtsp://192.168.5.104:554/live.sdp
Office_1	IP7330	rtsp://192.168.5.105:554/live.sdp
Office_4	FD7132	rtsp://192.168.5.129:554/live2.sdp
Office_3	FD7132	rtsp://192.168.5.129:554/live.sdp
Office_2	IP7330	rtsp://192.168.5.105:554/live2.sdp
Lobby_1	VS7100	rtsp://192.168.5.136:554/live.sdp
Lobby_2	I27151	rtsp://192.168.5.138:554/live.sdp



Display list for single display mode

Name	Model	Status
Office 1	IP7330	OK

"Multiple channel mode" The multiple channel mode can display four channels simultaneously (**Quad display**) or twenty-channel sequentially (**Sequential display**) on the analog video devices.

"Sequential display" You can add up to 20 video sources to the Display list, and the video receiver will show Channel 1, 2, 3, 4...in order with D1 resolution. Enter a "Channel switch period" for the sequential display. Click "Up" or "Down" to adjust the display order, or click "Remove" to delete the source from the Display list. Remember to click "Save" to enable the source settings.

For example:

Mode

Single channel mode
 Multiple channel mode

- Sequential display
Channel switch period: seconds
- Quad display

Video source list

Name	Model	Address
Area_1	SD7151	rtsp://192.168.5.104:554/live.sdp
Office_1	IP7330	rtsp://192.168.5.105:554/live.sdp
Office_4	FD7132	rtsp://192.168.5.129:554/live2.sdp
Office_3	FD7132	rtsp://192.168.5.129:554/live.sdp
Office_2	IP7330	
Lobby_1	VS710	
Lobby_2	I2715	

Windows Internet Explorer

! Display channels are limited to 20 in "Sequential display mode".

OK

Display list for sequential display mode

Name	Model	Status
Office_2	IP7330	OK
Office_3	FD7132	OK
Office_4	FD7132	N/A
Office_1	IP7330	OK
Office_2	IP7330	OK
Office_3	FD7132	OK
Office_4	FD7132	N/A
Office_1	IP7330	OK
Office_2	IP7330	OK
Office_3	FD7132	OK
Office_4	FD7132	N/A

"Quad display" You can add up to 4 video sources to the Display list, and the video receiver will show four channels at the same time. The maximum video resolution will be limited to CIF.

Mode

Single channel mode
 Multiple channel mode
 Sequential display
 Channel switch period: seconds
 Quad display

Video source list

Name	Model	Address
Area_1	SD7151	rtsp://192.168.5.104:554/live.sdp
Office_1	IP7330	rtsp://192.168.5.105:554/live.sdp
Office_4	FD7132	rtsp://192.168.5.129:554/live2.sdp
Office_3	FD7132	rtsp://192.168.5.129:554/live.sdp
Office_2	IP7330	
Lobby_1	VS7100	
Lobby_2	I27151	

Windows Internet Explorer

Display channels are limited to 4 in "Quad display mode".

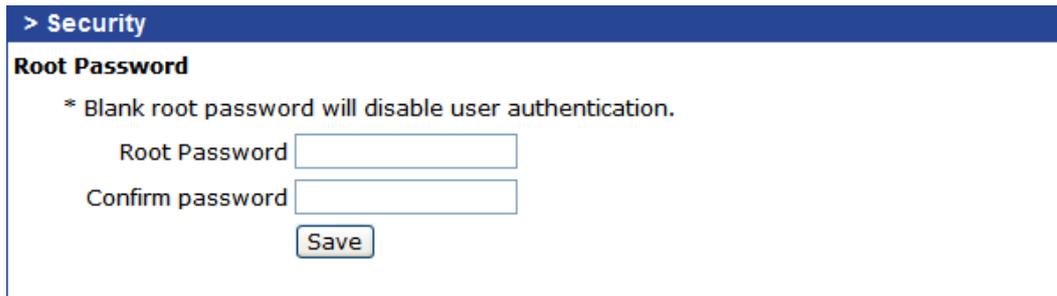
OK

Display list for quad display mode

Name	Model	Status
Office_1	IP7330	OK
Office_3	FD7132	OK
Office_2	IP7330	OK
Office_4	FD7132	N/A

Security settings

“Root password” Change the Administrator’s password by typing in the new password identically in both text boxes. The typed entries will be displayed as asterisks for security purposes.



> Security

Root Password

* Blank root password will disable user authentication.

Root Password

Confirm password

Save

<url> <http://<Video Receiver>/setup/security.html>

<Video Receiver> is the domain name or original IP address of the Video Receiver.

Network settings

Any changes made on this page will restart the system in order to validate the changes. Make sure every field is entered correctly before clicking on .

Network type

"LAN" & "PPPoE"

The default type is LAN. Select PPPoE if using ADSL

"Get IP address automatically" & "Use fixed IP address"

The default status is **"Get IP address automatically"**. This can be tedious having to perform software installation whenever the Video Receiver starts. Therefore, once the network settings, especially the IP address, have been entered correctly, select **"Use fixed IP address"** then the Video Receiver will skip installation at the next boot. The Video Receiver can automatically restart and operate normally after a power outage. Users can run IP installer to check the IP address assigned to the Video Receiver if the IP address is forgotten. **"IP address"** This is necessary for network identification.

"Subnet mask" This is used to determine if the destination is in the same subnet. The default value is "255.255.255.0".

"Default router" This is the gateway used to forward frames to destinations in a different subnet. Invalid router setting will fail the transmission to destinations in different subnet.

"Primary DNS" The primary domain name server that translates hostnames into IP addresses.

"Secondary DNS" Secondary domain name server that backups the Primary DNS.

"PPPoE" If using the PPPoE interface, fill in the following settings from ISP

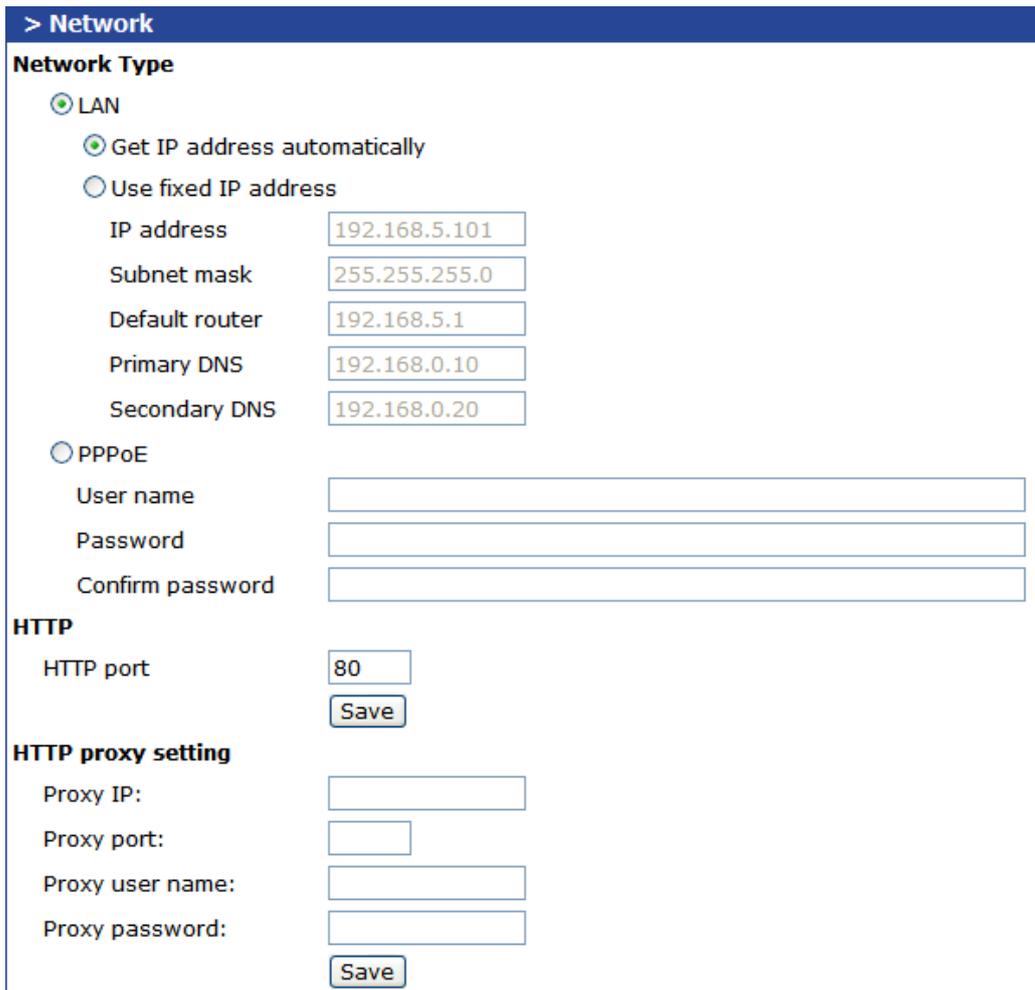
"User name" The login name of PPPoE account

"Password" The password of PPPoE account

"Confirm password" Input password again for confirmation

HTTP

“Http port” This can be other than the default Port 80. Once the port is changed, the users must be notified the change for the connection to be successful. For instance, when the Administrator changes the HTTP port of the Video Receiver whose IP address is 192.168.0.100 from 80 to 8080, the users must type in the web browser “http://192.168.0.100:8080” instead of “http://192.168.0.100”.



> Network

Network Type

LAN

Get IP address automatically

Use fixed IP address

IP address

Subnet mask

Default router

Primary DNS

Secondary DNS

PPPoE

User name

Password

Confirm password

HTTP

HTTP port

HTTP proxy setting

Proxy IP:

Proxy port:

Proxy user name:

Proxy password:

“Http proxy setting” If your network need to configure Http proxy, please enter related information in the blanks.

 Some invalid settings may cause the system failing to respond. Change the configuration only if necessary and consult with your network supervisor or experienced users for correct settings. Once the system has lost contact, refer to Appendix A for reset and restore procedures.

Email settings

When the SMTP server support SMTP authentication, users need to give the valid user name and password to send email via the server.

There are two external mail server can be configured, primary and secondary email server, The Video Receiver will use primary server as default , and use secondary server when primary server is unreachable.

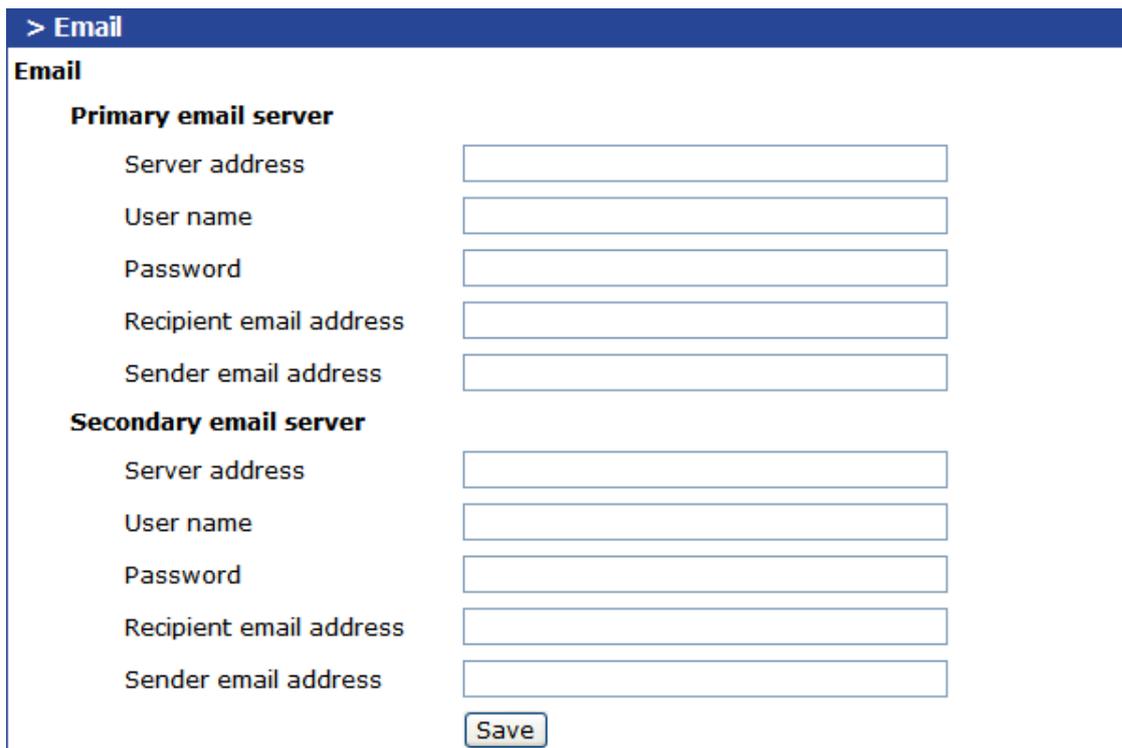
“Server address” The domain name or IP address of the external email server.

“User name” This granted user name on the external email server.

“Password” This granted password on the external email server.

“Recipient email address” The email address of the recipients for snapshots or log file. Multiple recipients must be separated by semicolon, ‘;’.

“Sender email address” The email address of the sender



> Email

Email

Primary email server

Server address

User name

Password

Recipient email address

Sender email address

Secondary email server

Server address

User name

Password

Recipient email address

Sender email address

Save

<url> <http://<Video Receiver>/setup/mail.html>

<Video Receiver> is the domain name or original IP address of the Video Receiver.

I/O settings

Video output

Video output modulation type. It can be "NTSC" or "PAL".

"Enable Overscan mode" Select it if you has smaller displayable area of your device.

Audio output

The audio output volume can be tuned in Video Receiver.



> I/O

Video output

NTSC PAL

Enable Overscan mode

Audio output

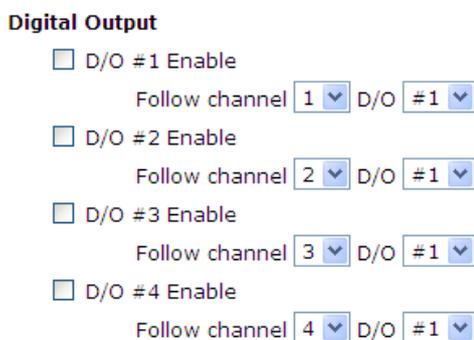
Volume: (1-100)

Digital output

Video Receiver supports four digital outputs, and they can be configured to follow the digital output of video source. This function is only for "Single channel mode" and "Quad display mode". "Sequential display mode" does not support this function.

In addition, if the linked video source does not support digital output, the D/O function will be disabled.

The digital output will follow D/O #1 ~ #4 (Ex:) of channel 1~4 (Ex:)



Digital Output

D/O #1 Enable
Follow channel D/O

D/O #2 Enable
Follow channel D/O

D/O #3 Enable
Follow channel D/O

D/O #4 Enable
Follow channel D/O

Keyboard

The keyboard can be connected with Video Receiver via RS485 interface. The following fields in Video Receiver must be set the same with the keyboard.

“**Baud rate**” The transmission speed between Video Receiver and keyboard

“**Data bits**” The length of a data

“**Stop bits**” The length of stop bit

“**Parity bits**” The type of parity check

Keyboard

Port settings

Baud rate:	2400 ▼
Data bits:	8 ▼
Stop bits:	1 ▼
Parity bits:	none ▼
<input type="button" value="Save"/>	

System log

The Video Receiver is able to send system log to the remote server as a backup. The protocol is compliant to RFC 3164. If you have external Linux server with “**syslogd**” service, use “-r” option to turn on the facility for receiving log from remote machine. Or you can use some software on Windows which is compliant to RFC 3164.

Check “**Enable remote log**” and input the “**IP address**” and “**port**” number of the log server to enable the remote log facility.

In the “**Current log**”, it displays the current system log file. The content of the log provides useful information about configuration and connection after system boot- up. The system log is stored in the Video Receiver’s buffer area and will be overwritten when reaching a certain amount.

The system will send mail with log file when system boot up if the Email settings page has been configured.

> System log

Remote Log

Enable remote log

Log server settings

IP address

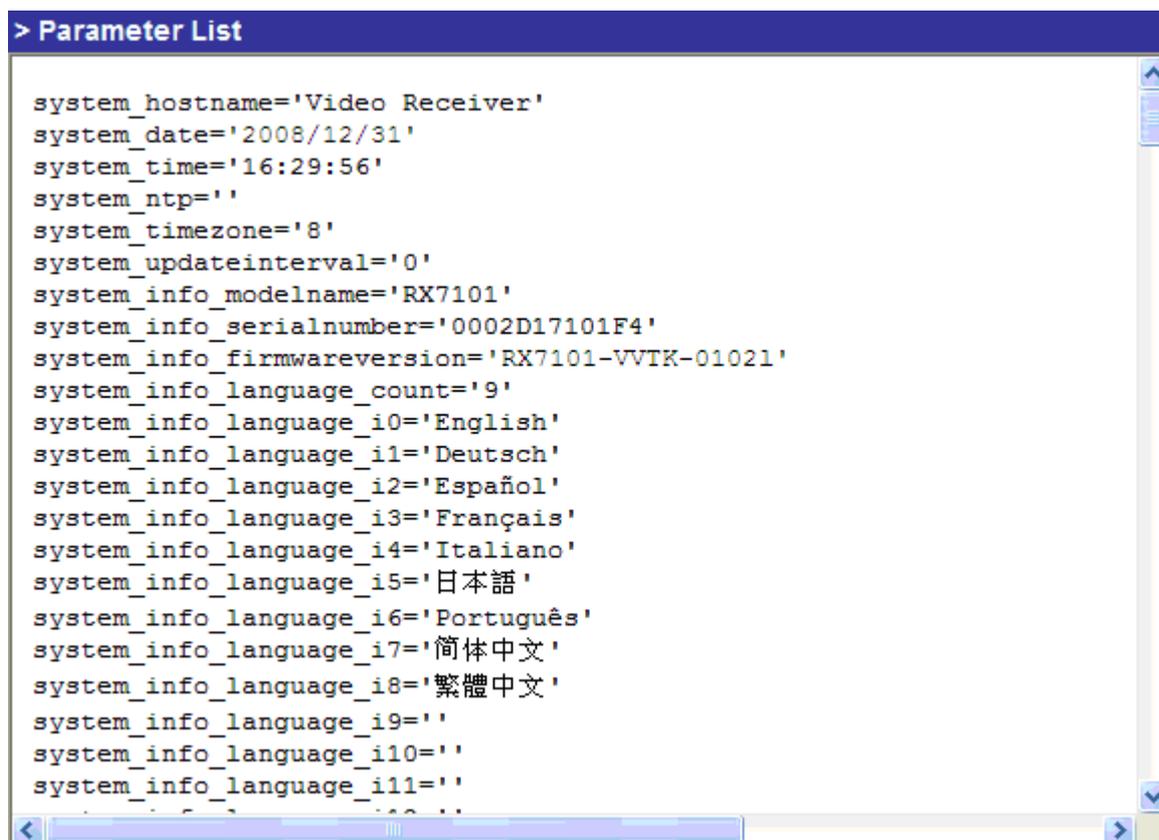
port

Current Log

```
Jan 5 09:35:12 SYS: Serial number = 0002D17101F4
Jan 5 09:35:12 SYS: System starts at Mon Jan 5 09:35:12 UTC 2009
Jan 5 09:35:12 NET: === NET INFO ===
Jan 5 09:35:12 NET: Host IP = 192.168.5.131
Jan 5 09:35:13 NET: Subnet Mask = 255.255.255.0
Jan 5 09:35:13 NET: Gateway = 192.168.5.1
Jan 5 09:35:13 NET: Primary DNS = 192.168.0.10
Jan 5 09:35:13 NET: Secondary DNS = 192.168.0.20
Jan 5 09:35:20 [HTTP]: http server:192.168.5.104, port=80, method=GET, error
code=80010019
Jan 5 09:35:23 [HTTP]: http server:192.168.5.104, port=80, method=GET, error
code=80010019
Jan 5 09:35:33 [HTTP]: http server:192.168.5.119, port=80, method=GET, error
code=80010019
Jan 5 09:35:36 [HTTP]: http server:192.168.5.119, port=80, method=GET, error
code=80010019
Jan 5 09:35:45 [HTTP]: http server:192.168.5.136, port=80, method=GET, error
code=80010019
Jan 5 09:35:48 [HTTP]: http server:192.168.5.136, port=80, method=GET, error
code=80010019
Jan 5 09:35:52 [HTTP]: http server:192.168.5.138, port=80, method=GET, error
code=80010019
Jan 5 09:35:55 [HTTP]: http server:192.168.5.138, port=80, method=GET, error
code=80010019
Jan 5 10:47:59 [HTTP]: http server:192.168.5.104, port=80, method=GET, error
code=80010019
Jan 5 10:51:54 last message repeated 4 times
```

Viewing system parameters

The View parameters page lists the entire system's parameters in alphabetical order. If you need technical assistance, please provide the information listed in this page.



```
> Parameter List

system_hostname='Video Receiver'
system_date='2008/12/31'
system_time='16:29:56'
system_ntp=''
system_timezone='8'
system_updateinterval='0'
system_info_modelname='RX7101'
system_info_serialnumber='0002D17101F4'
system_info_firmwareversion='RX7101-VVTK-01021'
system_info_language_count='9'
system_info_language_i0='English'
system_info_language_i1='Deutsch'
system_info_language_i2='Español'
system_info_language_i3='Français'
system_info_language_i4='Italiano'
system_info_language_i5='日本語'
system_info_language_i6='Português'
system_info_language_i7='简体中文'
system_info_language_i8='繁體中文'
system_info_language_i9=''
system_info_language_i10=''
system_info_language_i11=''
```

Maintenance

Three actions can be selected

“Reboot system” To turn off and then turn on the Video Receiver. It takes about one ~ two minutes to complete the process.

“Factory default” To restore the factory default settings. Any changes made so far will be lost and the system will be reset to the initial factory settings. The system will restart and require the installer program to set up the network again.

“Upgrade firmware” To upgrade the firmware on your Video receiver. It takes a few minutes to complete the process.

Note that do not power off the Video receiver during the upgrade.

Follow the steps below to upgrade firmware:

1. Download a new firmware file from VIVOTEK website. The file is in pkg file format.
2. Click Browse... and specify the firmware file.
3. Click Upgrade. The Video Receiver starts to upgrade and will reboot automatically when the upgrade completes.



The screenshot shows a web interface with a blue header bar containing the text "> Maintenance". Below the header, there are three sections:

- Reboot system**: A text description "Reboot the system." is followed by a "Reboot" button.
- Factory default**: A text description "Restore factory settings and lose any changes? System will restart and need installer program to setup network." is followed by a "Factory default" button.
- Upgrade firmware**: A text description "Select firmware file:" is followed by a text input field, a "浏览..." (Browse...) button, and an "Upgrade" button.

Language

Click this button to choose a language for the user interface. Language options are available in the following list:



Appendix

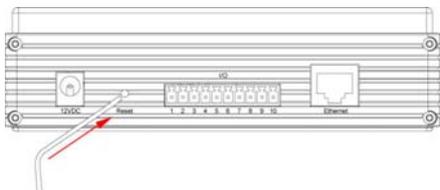
A. Troubleshooting

Status LED

The following table lists the LED patterns in all cases. The priority 1 is the highest priority. If there are multiple statuses at the same time, the Video Receiver will show the highest priority one.

	LED status	Description	Priority
1	Steady Red	Power on and system booting	5
	Red LED unlighted	Power off	
2	Steady Red + Blink Green every 1 sec.	Network works(heartbeat)	4
	Steady Red + Green LED unlighted	Network fail	
3	Steady Red + Blink Green every 0.15 sec.	UART control message	3
4	Blink Red every 0.15 sec. + Blink Green every 1 sec.	Upgrading F/W	2
5	Blink Red every 0.15 sec. + Blink Green every 0.15 sec.	Restore default	1

Reset and restore



There is a button in the back side of the Video Receiver. It is used to reset the system or restore the factory default settings.

RESET: Click on the button.

RESTORE:

1. Press on the button continuously.
2. Wait for all LED blink fast.
3. Free the button.



Restoring the factory defaults will erase any previous settings.

B. URL commands of the Video Receiver

For some customers who already have their own web site or web control application, the Video Receiver can be easily integrated through convenient URLs. This section lists the commands in URL format corresponding to the basic functions of the Video Receiver.

■ General CGI URL syntax and parameters

CGI parameters are written in lower-case and as one word without any underscores or other separators. When the CGI request includes internal camera parameters, the internal parameters must be written exactly as they are named in the camera or video server. The CGIs are organized in function related directories under the cgi-bin directory. The file extension of the CGI is required.

Syntax:

```
http://<servername>/cgi-bin/<subdir>[/<subdir>...]/<cgi>.<ext>  
[?<parameter>=<value>[&<parameter>=<value>...]]
```

■ Get server parameter values

Note: This request require administrator access

Method: GET/POST

Syntax:

```
http://<servername>/cgi-bin/admin/getparam.cgi?[<parameter>]  
[&<parameter>...]
```

Where the *<parameter>* should be *<group>[_<subgroup>][_<name>]* If you do not specify the any parameters, all the parameters on the server will be returned. If you specify only *<group>*, the parameters of related group will be returned. There may be none or multiple subgroups between group and subgroup. If you specify *<group>[_<subgroup>] [...][_<subgroupN>]*, the parameters of related subgroup will be returned.

When query parameter values, the current parameter value are returned.

Successful control requests returns parameter pairs as follows.

Return:

```
HTTP/1.0 200 OK\r\n  
Content-Type: text/html\r\n  
Context-Length: <length>\r\n  
\r\n  
<parameter pair>
```

where *<parameter pair>* is

<parameter> = <value>\r\n

[<parameter pair>]

<length> is the actual length of content.

Example: request IP address and it's response

Request:

```
http://192.168.0.123/cgi-bin/admin/getparam.cgi?network_ipaddress
```

Response:

```
HTTP/1.0 200 OK\r\n
Content-Type: text/html\r\n
Context-Length: 33\r\n
\r\n
network.ipaddress=192.168.0.123\r\n
```

■ Set server parameter values

Note: This request require administrator access

Method: GET/POST

Syntax:

```
http://<servername>/cgi-bin/admin/setparam.cgi?
[nosync= <value>&] <parameter> = <value>
[&<parameter> = <value> ...][&return= <return page>]
```

parameter	value	description
<group>[_<subgroup>]_<name>.	value to assigned	Assign <value> to the parameter <group>_<name>.
return	<return page>	Redirect to the page <return page> after the parameter is assigned. The <return page> can be a full URL path or relative path according the the current path. If you omit this parameter, it will redirect to an empty page. (note: The return page can be a general HTML file(.htm, .html) or a VIVOTEK server script executable (.vspx) file. It can not be a CGI command. It can not have any extra parameters. This parameter must be put at end of parameter list)

Return:

```
HTTP/1.0 200 OK\r\n
```

```
Content-Type: text/html\r\n
Context-Length: <length>\r\n
\r\n
<parameter pair>
```

where <parameter pair> is
<parameter> = <value>\r\n

[<parameter pair>]

Only the parameters that you set and readable will be returned.

Example: Set the IP address of server to 192.168.0.123

Request:

http://myserver/cgi-bin/admin/setparam.cgi?Network_IPAddress=192.168.0.123

Response:

HTTP/1.0 200 OK\r\n

Content-Type: text/html\r\n

Context-Length: 33\r\n

\r\n

network.ipaddress=192.168.0.123\r\n

■ Upgrade firmware

Note: This request requires administrator privilege

Method: POST

Syntax:

<http://<servername>/cgi-bin/admin/upgrade.cgi>

Post data:

```
fimage= <file name> [&return= <return page>] \r\n
```

```
\r\n
```

```
<multipart encoded form data>
```

Server will accept the upload file named <file name> to be upgraded the firmware and return with <return page> if indicated.

■ System logs

Note: This request require administrator privilege

Method: GET/POST

Syntax:

<http://<servername>/cgi-bin/admin/syslog.cgi>

Server will return the up-to-date system log.

Return:

```
HTTP/1.0 200 OK\r\n
Content-Type: text/plain\r\n
Content-Length: <syslog length>\r\n
\r\n
<system log information>\r\n
```

Parameter list

The follow is the list of the security level of parameters.

■ Security level:

SECURITY LEVEL	SUB-DIRECTORY	DESCRIPTION
0	anonymous	Unprotected.
6 [admin]	anonymous, viewer, dido, camctrl, operator, admin	Administrator's access right can fully control the camera's operation.
7	N/A	Internal parameters. Unable to be changed by any external interface.

■ Valid values:

VALID VALUES	DESCRIPTION
string[<n>]	Text string shorter than 'n' characters
password[<n>]	The same as string but display '*' instead

/<n>	Field length of string, password, or ip address on web page
integer	Any number between $(-2^{31} - 1)$ and $(2^{31} - 1)$
positive integer	Any number between 0 and $(2^{32} - 1)$
<m> ~ <n>	Any number between 'm' and 'n'
domain name[<n>]	A string limited to contain a domain name shorter than 'n' characters (eg. www.ibm.com)
email address [<n>]	A string limited to contain a email address shorter than 'n' characters (eg. joe@www.ibm.com)
ip address	A string limited to contain an ip address (eg. 192.168.1.1)
mac address	A string limited to contain mac address without hyphen or colon connected
boolean	A boolean value 1 or 0 represents [Yes or No], [True or False], [Enable or Disable].
<value1>, <value2>, <value3>, ...	Enumeration. Only given values are valid.
blank	A blank string
everything inside <>	As description

NOTE: The server should prevent to restart when parameter changed.

■ Available parameters on the server

Group: **sipuac**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
requesturi_domain	<ip address>	6/6	IP address of server
requesturi_sipport	1025 ~ 65535	6/6	SIP port of server
auth_username	string[64]	6/6	User name used for SIP authentication
auth_password	string[64]	6/6	Password used for SIP authentication

Group: **displaymodeinfo**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
single_c0_ sourceindex	-1, 0~19	6/6	Save selected source index in single channel mode. -1 => no source is selected
sequential_c<0~19>_ sourceindex	-1, 0~19	6/6	Save selected source index in sequential display list. -1 => no source is selected
quad_c<0~3>_ sourceindex	-1, 0~19	6/6	Save selected source index in quad display list. -1 => no source is selected

 Group: **sourceinfo_c<0~(n-1)>** n is the source count

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
address	<domain name>, <ip address>, <blank>[128]	6/6	Full address to access the media
name	string[16]	6/6	Alias name of source
model	string[15]	6/6	Model of IP Camera or Video server. Ex: PT7137
firmver	string[15]	6/6	Firmware version
video_codec	string[15]	6/6	Video codec type
audio_codec	string[15]	6/6	Audio codec type
do_number	0, <positive integer>	6/7	Number of DO
ptzenabled	< boolean >	6/6	indicate whether to support PTZ control
isptz	0~2	6/7	record "camctrl_c0_isptz" value of source. 0 => camera control disable 1 => ptz camera 2 => Transparent HTTP Tunnel

camctrltunnel	<boolean>	6/7	Indicate whether to support the http tunnel for camera control
connection_status	<boolean>	6/6	Current connection status. 0 => connect fail 1 => connect success
connection_former	<boolean>	6/6	Previous connection status. 0 => connect fail 1 => connect success

Group: **system**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
hostname	string[40]	6/6	host name of server (Network Camera, Wireless Network Camera, Video Server, Wireless Video Server)
date	<yyyy/mm/dd>, keep, auto	6/6	Current date of system. Set to 'keep' keeping date unchanged. Set to 'auto' to use NTP to synchronize date.
time	<hh:mm:ss>, keep, auto	6/6	Current time of system. Set to 'keep' keeping time unchanged. Set to 'auto' to use NTP to synchronize time.
ntp	<domain name>, <ip address>, <blank>	6/6	NTP server
timezone	-12 ~ 12	6/6	time zone, 5 means GMT +5
updateinterval	0 ~ 2592000	6/6	0 to Disable automatic time adjustment, otherwise, it means the seconds between NTP automatic update interval.
restore	0, <positive integer>	7/6	Restore the system parameters to default value. Restart the server after <value> seconds if <value> is positive integer.
reset	0, -1,	7/6	Restart the server after <value>

	<positive integer>		seconds if <value> is non-negative.
restoreexc eptnet	0, <positive integer>	7/6	Restore the system parameters to default value except (ipaddress, subnet, router, dns1, dns2, ddns settings). Restart the server after <value> seconds if <value> is positive integer.

SubGroup of **system: info** (The fields in this group are unchangeable.)

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
modelname	string[40]	0/7	ODM specific model name of server (eg. DCS3220)
serialnumber	<mac address>	0/7	12 characters mac address without hyphen connected
firmwareversio n	string[40]	0/7	The version of firmware, including model, company, and version number in the format <MODEL-BRAND-VERSION>
language_coun t	<integer>	0/7	number of webpage language available on the server
language_i<0 ~(count-1)>	string[16]	0/7	Available language lists

Group: **security**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
user_i0_name	string[64]/18	6/7	User's name, only root's account
user_i0_pass	password[64] /18	6/6	User's password, only root's account
user_i0_privile ge	admin	6/7	Privilege of user i0
usercount	1	6/7	User count

Group: **source_c<0~(n-1)>** n is the source count

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
address	<domain name>, <ip address>, <blank>[128]/40	6/6	IP Camera or Video server
port	80, 1025 ~ 65535	6/6	HTTP port
username	string[64]/16	6/6	User's name
password	password[64]/16	6/6	User's password
protocol	multicast, udp, tcp, http	6/6	The protocol of streaming
media	av, audio, video	6/6	The media for streaming
autoconnect	<boolean>	6/6	Auto connect to the server
enablehttpproxy	<boolean>	6/6	0 => disable http proxy 1 => enable http proxy

Group: **videoout**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
channelmode	single, multiple	6/6	Single channel mode always shows the channel 1. There are two display mode in multiple channel mode.
displaymode	sequential, quad	6/6	Display mode in multiple channel mode
switchperiod	5-99	6/6	The channel switch period in sequential display mode
modulation	ntsc, pal	6/6	Modulation for video output
overscan	<boolean>	6/6	Support OverScan mode

Group: **audioin**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
c0_gain	0~31	6/6	Gain of input
c0_s0_codecype	g711	6/7	codec type for audio input
c0_s0_g711_mode	pcmu, pcma	6/7	set audio mode for input
c0_s0_g711_samplerate	8000,16000,32000,44000	6/7	Set sample rate of G711 codec

 Group: **audioout**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
enable	<boolean>	6/7	Enable audio output
channel	0~3	6/6	Output audio channel
volume	1~100	6/6	The volume of audio output

 Group: **network**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
type	lan, pppoe	6/6	Network connection type
resetip	<boolean>	6/6	1 => get ipaddress, subnet, router, dns1, dns2 from DHCP server at next reboot 0 => use preset ipaddress, subnet, router, dns1, and dns2
ipaddress	<ip address>[15]/16	6/6	IP address of server
subnet	<ip address>	6/6	subnet mask
router	<ip address>	6/6	default gateway
dns1	<ip address>	6/6	primary DNS server
dns2	<ip address>	6/6	secondary DNS server

Subgroup of **network**: **http**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
port	80, 1025 ~ 65535	6/6	HTTP port

 Subgroup of **network**: **ftp**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
port	21, 1025 ~ 65535	6/6	FTP port

 Subgroup of **network**: **pppoe**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
user	string[80]/40	6/6	PPPoE account user name
pass	password[64]/64	6/6	PPPoE account password

 Subgroup of **network**: **httpproxy**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
address	<ip address>	6/6	IP address of http proxy server
port	1 ~ 65535	6/6	HTTP proxy port
username	string[64]/16	6/6	The username to login in the http proxy server.
password	string[64]/16	6/6	The password of the user.

 Group: **server**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
email_ i<0~(n-1)>_address	string[128]/ 40	6/6	The address of SMTP server
email_ i<0~(n-1)>_username	string[64]/4 0	6/6	The username to login in the server
email_ i<0~(n-1)>_passwd	string[64]/4 0	6/6	The password of the user

email_ i<0~(n-1)>_senderemail	string[128]/ 40	6/6	The email address of sender
email_ i<0~(n-1)>_recipientemail	string[128]/ 40	6/6	The email address of recipient

Group: **do_i<0~(ndo-1)>** (capability.ndo > 0)

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
enable	<boolean>	6/6	Enable digital output
followchannel	0~3	6/6	The DO status follows channel 1,2,3,4.
serverdo	0(~3)	6/6	The DO index of server

Group: **uart_i<0~(n-1)>** n is uart port count (capability.nuart>0)

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
baudrate	110, 300, 600, 1200, 2400, 4800, 9600, 19200,38400	6/6	set baud rate of COM port
databit	5,6,7,8	6/6	
stopbit	1,2	6/6	0 1 2-1.5 , data bit is 5 2-2
paritybit	none, odd, even	6/6	

Group: **syslog**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
enableremotelog	<boolean>	6/6	enable remote log
serverip	<IP address>	6/6	Log server IP address
serverport	514, 1025~65535	6/6	Server port used for log

Group: **capability**

NAME	VALUE	SECURITY (get/set)	DESCRIPTION
api_httpversion	0201a	0/7	The HTTP API version.
nir	0, <positive integer>	0/7	number of IR interface
ndi	0, <positive integer>	0/7	number of digital input
ndo	0, <positive integer>	0/7	number of digital output
naudioin	0, <positive integer>	0/7	number of audio input
naudioout	0, <positive integer>	0/7	number of audio output
nvideoin	<positive integer>	0/7	number of video input
nvideochannel	<positive integer>	0/7	number of video channel
naudiochannel	0, <positive integer>	0/7	number of audio channel
nuart	0, <positive integer>	0/7	number of UART interface
ptzenabled	< boolean >	0/7	indicate whether to support PTZ control
ptzenabledclient	< boolean >	0/7	indicate whether to support PTZ control at client side
protocol_https	< boolean >	0/7	indicate whether to support http over SSL
protocol_rtsp	< boolean >	0/7	indicate whether to support rtsp
protocol_sip	<boolean>	0/7	indicate whether to support sip
protocol_rtp_multicast_ scalable	<boolean>	0/7	indicate whether to support scalable multicast
protocol_rtp_multicast_	<boolean>	0/7	indicate whether to support

backchannel			backchannel multicast
protocol_rtp_tcp	<boolean>	0/7	indicate whether to support rtp over tcp
protocol_rtp_http	<boolean>	0/7	indicate whether to support rtp over http
protocol_spush_mjpeg	<boolean>	0/7	indicate whether to support server push motion jpeg
protocol_snmp	<boolean>	0/7	indicate whether to support snmp
videoin_resolution	<a list of the available resolution separates by comma)	0/7	available resolutions list
videoin_codec	<a list of the available codec types separators by comma)	0/7	available codec list
videoout_type	0, 1, 2, 3	0/7	0 => no 1 => NTSC 2 => PAL 3 => BOTH
audio_aec	<boolean>	0/7	indicate whether to support acoustic echo cancellation
audio_extmic	<boolean>	0/7	indicate whether to support external microphone input
audio_linein	<boolean>	0/7	indicate whether to support external line input
audio_lineout	<boolean>	0/7	indicate whether to support line output
audio_headphoneout	<boolean>	0/7	indicate whether to support headphone output
audioin_codec	<a list of the available codec	0/7	available codec list for audio input

	types separators by comma>		
camctrl_httptunnel	<boolean>	0/7	Indicate whether to support the http tunnel for camera control
camctrl_httptunnelclient	<boolean>	0/7	Indicate whether to support the http tunnel for camera control at client side
uart_httptunnel	<boolean>	0/7	Indicate whether to support the http tunnel for uart transfer
uart_httptunnelclient	<boolean>	0/7	Indicate whether to support the http tunnel for uart transfer at client side
transmission_mode	Tx, Rx, Both	0/7	Indicate what kind of transmission mode the machine used. TX: server, Rx: receiver box, Both: DVR?.
network_wire	<boolean>	0/7	Indicate whether to support the Ethernet
network_wireless	<boolean>	0/7	Indicate whether to support the wireless
wireless_s802dot11b	<boolean>	0/7	Indicate whether to support the wireless 802.11b+
wireless_s802dot11g	<boolean>	0/7	Indicate whether to support the wireless 802.11g
wireless_encrypt_wep	<boolean>	0/7	Indicate whether to support the wireless WEP
wireless_encrypt_wpa	<boolean>	0/7	Indicate whether to support the wireless WPA
wireless_encrypt_wpa2	<boolean>	0/7	Indicate whether to support the wireless WPA2

D. Technical specifications

Specifications	
System <ul style="list-style-type: none">· CPU: VVTK-1000 SoC, PNX-1502· RAM: 32MB SDRAM· ROM: 8MB FLASH ROM· Embedded OS: Linux 2.4	Security <ul style="list-style-type: none">· Administrator password authentication
Video <ul style="list-style-type: none">· Motion JPEG video with resolution up to D1· MPEG-4 video with resolution up to D1· 4-channel CIF real-time decoding· Frame rates: up to 30fps· Streaming:<ul style="list-style-type: none">· MPEG-4 streaming over UDP, TCP, or HTTP· MPEG-4 multicast streaming· MJPEG streaming over HTTP	Dimensions <ul style="list-style-type: none">· 166 mm (D) x 147 mm (W) x 42 mm (H)
Audio <ul style="list-style-type: none">· GSM-AMR speech decoding· AAC audio decoding· Interface:<ul style="list-style-type: none">· External microphone input	Weight <ul style="list-style-type: none">· Net: 703 g
General I/O <ul style="list-style-type: none">· 4 digital output· RS-485	LED Indicator <ul style="list-style-type: none">· System activity and network link indicator
Networking <ul style="list-style-type: none">· Protocols: TCP/IP, HTTP, SMTP, FTP, NTP, DNS, DHCP, RTSP/RTP/RTCP, and PPPoE· Ethernet<ul style="list-style-type: none">· 10 baseT or 100 baseT Fast Ethernet auto negotiation	Power <ul style="list-style-type: none">· 12V DC· Consumption: Max. 6 W
	Approvals <ul style="list-style-type: none">· CE, FCC, VCCI
	Operating Environments <ul style="list-style-type: none">· Temperature: 0 °~50 °C (32 °~122 °F)· Humidity: 20 % ~ 80 % RH
	Viewing System Requirements <ul style="list-style-type: none">· OS: Microsoft Windows 98SE/ME/2000/XP· Browser: Internet Explorer 6 or above
	Installation and Maintenance <ul style="list-style-type: none">· Installation Wizard 2· Supports firmware upgrade

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Electromagnetic Compatibility (EMC)

FCC Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions.

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a partial installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Liability

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